

NEW CHIHUAHUAN UMBELLIFERAE

BY

LINCOLN CONSTANCE¹ AND ROBERT A. BYE, JR.²

Our knowledge of the Umbelliferae of the Mexican Estado de Chihuahua began apparently with Wislizenus' pioneer journey to northern Mexico just before the middle of the 19th Century, which yielded *Eryngium heterophyllum* Engelm. The activities of the 1880s' of those two doughty American collectors, Palmer and Pringle, led to the description of *Arracacia edulis* S. Wats., *Eryngium madreense* S. Wats., *Eulophus tenuifolius* S. Wats., *E. ternatus* S. Wats., *Museniopsis ternata* var. *filifolia* C. & R., *Prionosciadium madreense* S. Wats., and *P. Pringlei* S. Wats. A spate of field investigations at the turn of the century by Goldman, Nelson, M. E. Jones, and Townsend and Barber led to the discovery of *Conioselinum mexicanum* C. & R., *Eryngium fluitans* M. E. Jones, *E. Goldmanii* Hemsl., *E. medium* Hemsl., *Ligusticum Goldmanii* C. & R., *L. madreense* C. & R., *L. Nelsonii* C. & R., *Museniopsis pubescens* C. & R., and *Prionosciadium Townsendii* C. & R. In the 1930s' there was another wave of collecting by Gentry, LeSueur, Muller and Pennell. Gentry's intensive study of Río Mayo plants led to the description of *Eryngium calaster* Standl. Up to the present, some thirty taxa of Umbel-

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liferae are known to occur in the state, according to the taxonomic concepts of Mathias and Constance (1944–45). Since more than one-third of these taxa belong to the difficult genus *Eryngium*, this total is susceptible to change.

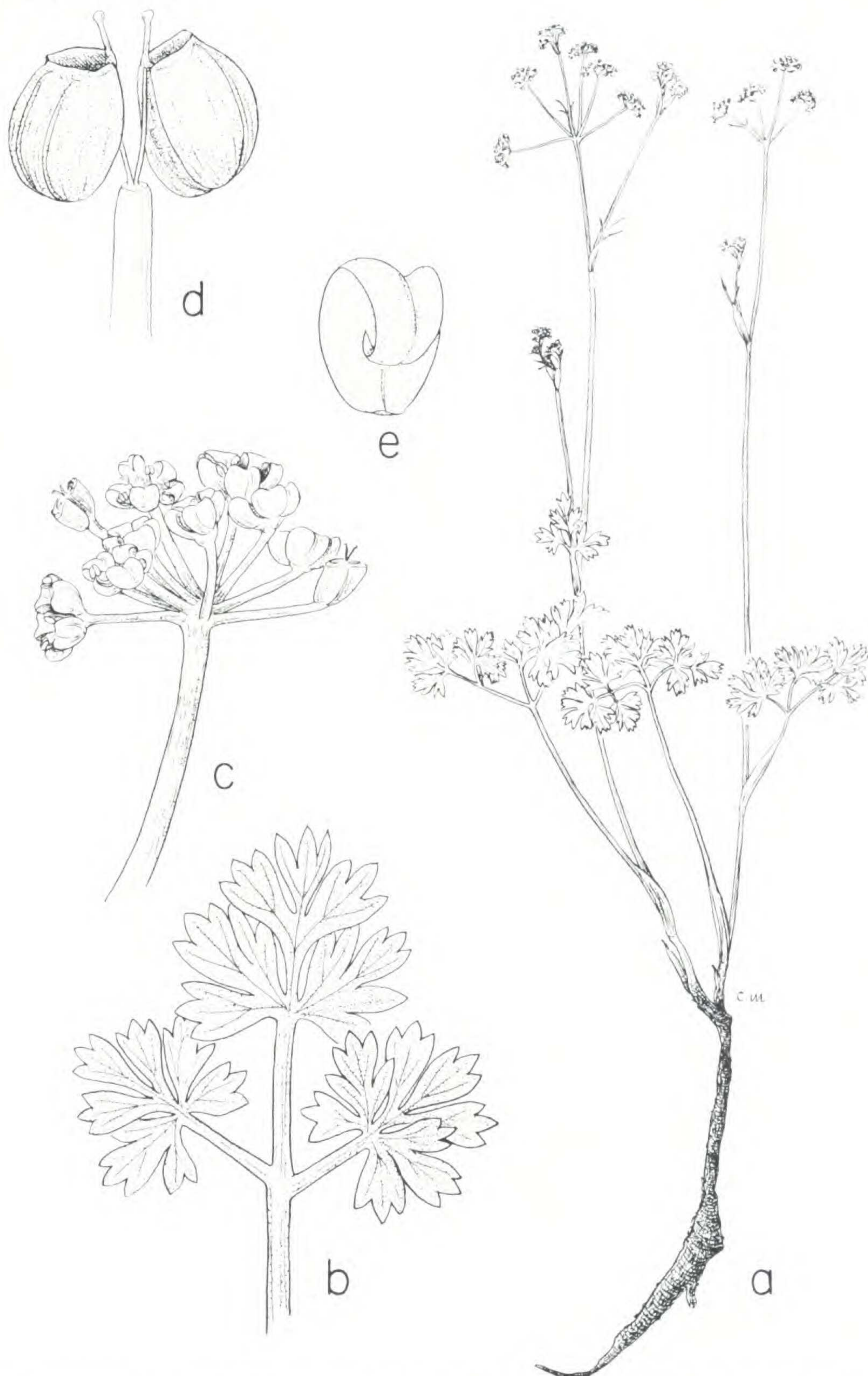
In his field studies³ of the ethnobotany of the Tarahumara centered in the Sierra Madre of southwestern Chihuahua, the junior author has given particular attention to Umbelliferae. As a result, he obtained material of no fewer than twenty taxa (including cytological material of many of them). Four of the collections represent apparently undescribed species. The purpose of this paper is to put them adequately on record.

***Donnellsmithia silvicola* Constance & Bye sp. nov.**

Plantae perennes caulescentes humiles condensatae; caules simplices vel pauciramosae sparsim foliati 8–25 cm. alti e radice palari tumida omnino glabrae; folia basalia deltoideo-orbiculata 1–3 cm. longa, 1.5–5 cm. lata, trifoliata, foliolis 3 ovalibus orbiculatisve, obtusis lobatis vel pinnatifidis diametro 1–2 cm.; petioli 1–8 cm. longi anguste scarioso-vaginantibus; folia caulina ea basalia simulantia sed sursum reducta vaginis parum dilatatis; pedunculi usque ad 2 cm. longi pauci alternati graciles umbellis plerumque lateralibus sessilibus subsessilibusve; involucrium nullum; involucellum nullum; radii 2–5 filiformes patenti-adscendentes 6–25 mm. longi; pedicelli fertiles 0–2, 3–4 mm. longi; flores flavo-virentes; stylopodium depressum, stylis brevissimis; carpophorum usque ad basim bipartitum; fructus immaturus ovoideo-orbicularis 1.5 mm. longus, 2 mm. latus ad apicem ver-

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PLATE LXI



Donnellsmithia silvicola Const. & Bye. a, Habit, $\times \frac{1}{2}$; b, basal leaf, $\times 2$; c, flowering umbellet, $\times 4$; d, immature fruit, $\times 10$; e, petal, $\times 10$. All from Bye 6376.

sus truncatus basi rotundatus, costis humilibus filiformibus; vittae et seminum superficies non visae; chromosomatum numerus $n = 20$.

Small, compact perennials from a fleshy taproot, 8–25 cm. high, the stem simple or few-branched, very sparsely leafy, glabrous throughout; basal leaves deltoid-orbicular, 1–3 cm. long, 1.5–5 cm. broad, trifoliate with 3 oval to orbicular, obtuse, lobed to pinnatifid leaflets 1–2 cm. in diameter; petiole 1–8 cm. long, narrowly scarious-sheathing; cauline leaves like the basal but reduced upward, the sheaths slightly dilated; peduncles few, alternate, slender, up to 2 cm. long, but most umbels lateral and sessile or subsessile; involucre 0, or of a single trifid bract; rays 2–5, filiform, spreading-ascending, 6–25 mm. long; involucl 0; fertile pedicels 0–2 (many umbellets staminate), 3–4 mm. long; flowers greenish-yellow; stylopodium depressed, not evident; styles very short; carpophore 2-cleft to base; immature fruit ovoid-orbicular, 1.5 mm. long, 2 mm. broad, truncate at apex, rounded at base, the ribs low, filiform; vittae and seed face not seen; chromosome number $n = 20$.

TYPE. Chihuahua: Municipio de Guazapares, among *Pinus ponderosa*, *P. leiophylla*, *Quercus* sp. and *Arbutus* sp., on recently logged ridge, elevation 8100 feet, off road northwest of Estación San Rafael to Las Lagunitas, 21 July 1974, Robert A. Bye, Jr. 6376 (GH: holotype; ECON, UC).

The plant was rather abundant but very local on slopes that had recently been disturbed by logging operations.

Donnellsmithia silvicola appears to be most closely related to *D. serrata* (C. & R.) Math. & Const. and *D. dissecta* (C. & R.) Math. & Const., both species of southern Mexico. It is unlike both in its lower stature and glabrous foliage. From the former, it differs also in its shorter rays; from the latter, in its lack of an involucl. The most striking disparity, however, is in its uniquely distinctive leaf form.

Tauschia bicolor *Constance & Bye sp. nov.*

Plantae brevi-caulescentes acaulescentesve glabrae, caulibus gracilibus 10–40 cm. altis e caudice gracili; folia basalia rosulata triangulari-ovata vel ovata 1.5–8 cm. longa, 2–6 cm. lata, profunde trilobata vel ternata vel imparipinnata foliolis 1–3-partibus late ovalibus vel anguste oblongis serratis lobatisque vel pinnatifidis, superne cinereis, inferne purpureis; petioli anguste vaginantes 1.5–10(–25) cm. longi; folia caulina pauca; pedunculi graciles 7–20 cm. longi; involucrum plerumque nullum; radii 8–12 eis exterioribus fertilibus 5–11 mm. longis; involucellum dimidiatum bracteolis 3–5 linearibus acutis 1–3 mm. longis; pedicelli crassi 1–2 mm. longi fructo centrali saepe subsesseli; flores purpurei, petalis intus albis extus purpureis; stylopodium nullum, stylis valde gracilibus; carpophorum bipartitum dimidiis bifidis; fructus ovoideus apice truncatus basi rotundatus, glaber, 2.5–3 mm. longus, 2 mm. latus, costis filiformibus acutis quam intervallis multo angustioribus; vittae in intervallis plures in commissuris 2; seminum superficies plana; chromosomatum numerus $n=22$.

Plants rather slender, short-caulescent to acaulescent, the stems slender, 1 or 2, 10–40 cm. high from a slender rootstock, glabrous; basal leaves rosulate, triangular-ovate to ovate, 1.5–8 cm. long, 2–6 cm. broad, deeply 3-lobed or ternate to pinnate with 1–3 pairs of broadly oval to narrowly oblong, serrate and lobed to pinnatifid leaflets 8–30 mm. long, 3–30 mm. broad, ashy-pale above, purplish beneath; petioles 1.5–10(–25) cm. long, narrowly sheathing; cauline leaves few, reduced upward; peduncles terminal, slender, 7–20 cm. long; involucre of a linear bract or usually 0; rays 8–12, 5–11 mm. long, apparently only the outer fertile; involucel dimidiate, the bractlets 3–5, linear, acute, 1–3 mm. long; pedicels stout, 1–2 mm. long, the central fruit often subsessile;

flowers purple, the petals white within, deep purple on the back; styles very slender, 1.5–2 mm. long, spreading, purple (contrasting with a white disc); carpophore 2-parted, the halves bifid; fruit ovoid, 2.5–3 mm. long, 2 mm. broad, truncate at apex, rounded at base, the ribs filiform, acute, much narrower than the intervals; vittae several in the intervals, 2 on the commissure; seed face plane; chromosome number $n=22$.

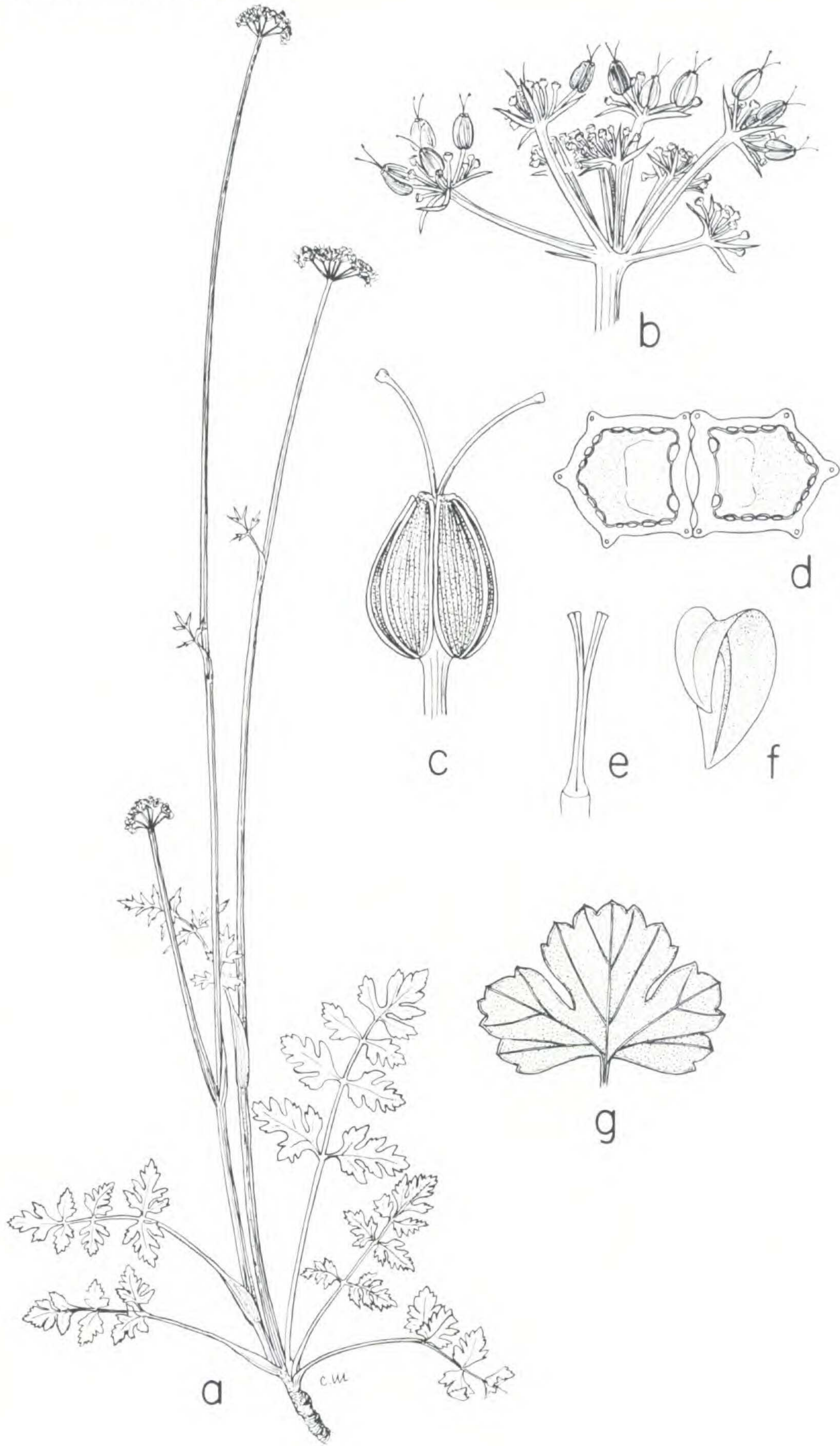
TYPE: Chihuahua: near boundary of Municipio de Batopilas and Municipio de Urique, between Quirare and Basigochic, elevation about 6900 feet, flowers red, 8 June 1973, *Robert A. Bye, Jr. 4068* (GH: holotype; ECON, UC). It was collected in the same locality on 31 May 1973, *Bye 3863* (ECON, UC), and 6 October 1975, *Bye 6965* (ECON, UC).

Tauschia bicolor, known to the Tarahumara as “masiáwari” (or “masiówari”)⁴, is considered a quelite or pot-herb, although it is not commonly consumed today. The young tender leaves can be collected during the fall as well as during the spring. To date, we know of only one locality for this herb, which is eagerly devoured by grazing goats and sheep. The plants are restricted to the western slopes above Arroyo Basigochic near an isolated stand of *Abies durangensis*. They are common on moist (not wet) eroded slopes of partially open pine and oak forest, where they often grow with *Chimaphila* and *Galium*, while scattered individuals can be found in crevices of white volcanic rock or in thin soil of the mixed wood forest. Due to heavy grazing pressure, few plants are able to produce mature fruits. The rhizomes appear to be important in the vegetative propagation of the

PLATE LXII. *Tauschia bicolor* Const. & Bye. a, Habit, $\times \frac{1}{2}$; b, fruiting umbel, $\times 2$; c, mature fruit, $\times 8$; d, fruit transection, $\times 15$; e, carpophore, $\times 8$; f, petal, $\times 15$; g, first basal leaf, $\times \frac{1}{2}$. a–d, f, from Bye 4068; e, from Bye 6965; g, from Bye 3863.

⁴ One informant referred to this herb as “kurisove”.

PLATE LXII



population. Indeed, this characteristic may be the key to the survival of the population in the immediate future, because a road building program will destroy the site within the next year.

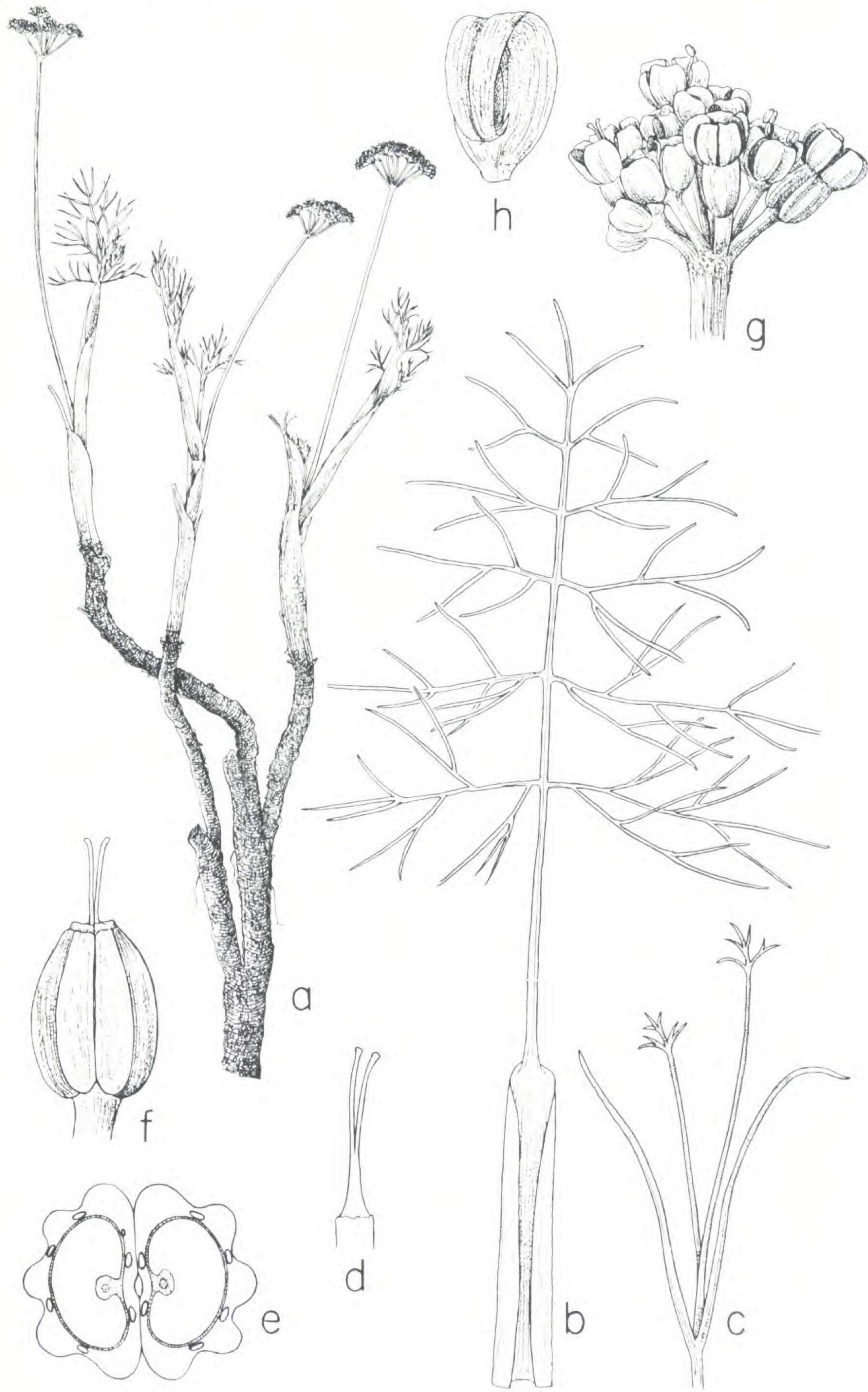
Although plants relatively similar to *Tauschia bicolor* in habit may be found in such genera as *Aletes* and *Arracacia* as well as in *Tauschia*, the combination of glabrous herbage, ternate or pinnate leaves with serrate to pinnatifid leaflets, fertile outer rays, dimidiate involucrel, stout pedicels with an often subsessile central fruit, petals purple/red externally and white internally, very slender styles, and a bipartite carpophore with bifid halves appears to be unique.

***Tauschia tarahumara* Constance & Bye sp. nov.**

Plantae humiles breviter caulescentes glabrae, caulibus pluribus 12–30 cm. altis e caudice elongata ramosa carnosa, praeter inflorescentiam puberulentam; folia ovata 3–5 cm. longa, 2–4 cm. lata, 2–3-pinnata, divisionibus ultimis lineari-filiformibus breviter mucronatis 5–20 mm. longis, ca. 0.5 mm. latis; petioli 1–6 cm. longi graciles anguste scarioso-vaginant; folia caulina reducta sessilia vaginis conspicue scariosis praedita; pedunculi 6–12 cm. longi plerumque terminales graciles sub umbella puberulentes; involucreum nullum; involucellum nullum; radii 6–12 usque ad 1 cm. longi puberulenti; pedicelli 1–3 mm. longi eis exterioribus fertilibus; flores rhodopurpurei; styli erecti ca. 0.5 mm. longi; carpophorum bifidum; fructus ovoideus 5–7 mm. longus, 3–5 mm. latus ad apicem versus truncatus basi rotundatus, costis humilibus rotundatisque quam intervallis latioribus; vit-

PLATE LXIII. *Tauschia tarahumara* Const. & Bye. a, Habit, $\times \frac{1}{2}$; b, basal leaf, $\times 1$; c, seedling, $\times 1$; d, carpophore, $\times 5$; e, fruit transection, $\times 7$; f, mature fruit, $\times 4$; g, flowering umbellet, $\times 5$; h, petal, $\times 20$. a–b, g–h, from Bye 6288; c, from Bye 7027 (Const. 1918); d–f, from 7027.

PLATE LXIII



tae magnae in intervallis una in commisuris 2; seminum superficies anguste sulcata; chrosomatum numerus $n = 44$.

Plants low, shortly caulescent, the stems several, 12–30 cm. high from a very elongate, branched, fleshy caudex, glabrous except for the puberulent inflorescence; leaves ovate, 3–5 cm. long, 2–4 cm. broad, 2–3-pinnate, the ultimate divisions linear-filiform, 5–20 mm. long, about 0.5 mm. broad, shortly mucronate; petioles slender, 1–6 cm. long, narrowly scarious-sheathing, the cauline leaves with conspicuous scarious sheaths and sessile reduced blades; peduncles mostly terminal, slender, 6–12 cm. long, puberulent beneath the umbel; involucre and involucl 0; rays 6–12, up to 1 cm. long, puberulent; pedicels 1–3 mm. long, the outer fertile; flowers deep red-purple; styles about 0.5 mm. long, mostly erect; carpophore bifid; fruit ovoid, 5–7 mm. long, 3–5 mm. broad, truncate at apex, rounded at base, the ribs low and rounded, broader than intervals; vittae large, solitary in the intervals, 2 on the commissure; seed face narrowly sulcate; chromosome number $n = 44$.

TYPE: Chihuahua: Municipio de Bocoyna, in wettest portions of grazed meadow with dark mucky soil, elevation ca 7300 feet, N of San Ignacio Arareco, E of Creel, 11 July 1974, *Robert A. Bye, Jr.* 6288 (GH: holotype; ECON, UC). It was collected also in similar habitats in the general vicinity of San Ignacio Arareco, SE or E of Creel, on 14 July 1971, *Bye* 1535 (ECON), 16 July 1972, *Bye* 2369 (ECON), 5 July 1973, *Bye* 4150 (GH, UC), and 19 July 1973, *Bye* 4272B (ECON, UC), 9 October 1975, *Bye* 7027 (UC) and 7034 (ECON).

The older Tarahumara of San Ignacio call this herb ‘‘huve’’ and ascribe medicinal properties to the distinctive rhizome. It is ground, mixed with oil or fat, and rubbed on the affected parts of the body to treat rheumatism. Only a small piece of the rhizome is placed in a cavity in order to alleviate toothache, because it is said to be very strong. Some young Tarahumara in the San

Ignacio region claim it is an edible green and call it "sepe".

This deep rooted herb is restricted to a narrow interzone in the moist upland meadows, between the low, wet area (often occupied by standing water during parts of the rainy season) with *Plantago* and *Ranunculus* species, and the slightly elevated and drier area with *Tagetes lucida*. Even though this umbel has a deep, vertical rootstock (over 50 cm. long with a relatively constant diameter) which may be well adapted to environmental changes, such human-related activities as grazing, cultivation, gully and sheet erosion, draining and soil compaction in these accessible meadows threaten to destroy the few known populations of this curious plant.

In the published key to the species of *Tauschia* (Mathias & Constance, 1944, pp. 81-82), the new taxon would key to either *T. tenuifolia* (S. Wats.) Math. & Const., a little known Chihuahuan plant, or to *T. mariana* (S. Wats.) C. & R. ex Drude (= *T. decumbens* (Benth.) C. & R. ex Drude), which occurs from México to Michoacán. It differs from both, however, by its lack of an involucl and its smaller fruit with broad, obtuse costae. In addition, *T. tarahumara* is unlike *T. tenuifolia* in lacking a densely fibrous stem base and in its more numerous but shorter rays. From *T. decumbens*, *T. tarahumara* may be distinguished by its lower stature, broader leaves with narrower divisions, and red-purple flowers, in addition to its geographic range.

***Eryngium Gentryi* Constance & Bye sp. nov.**

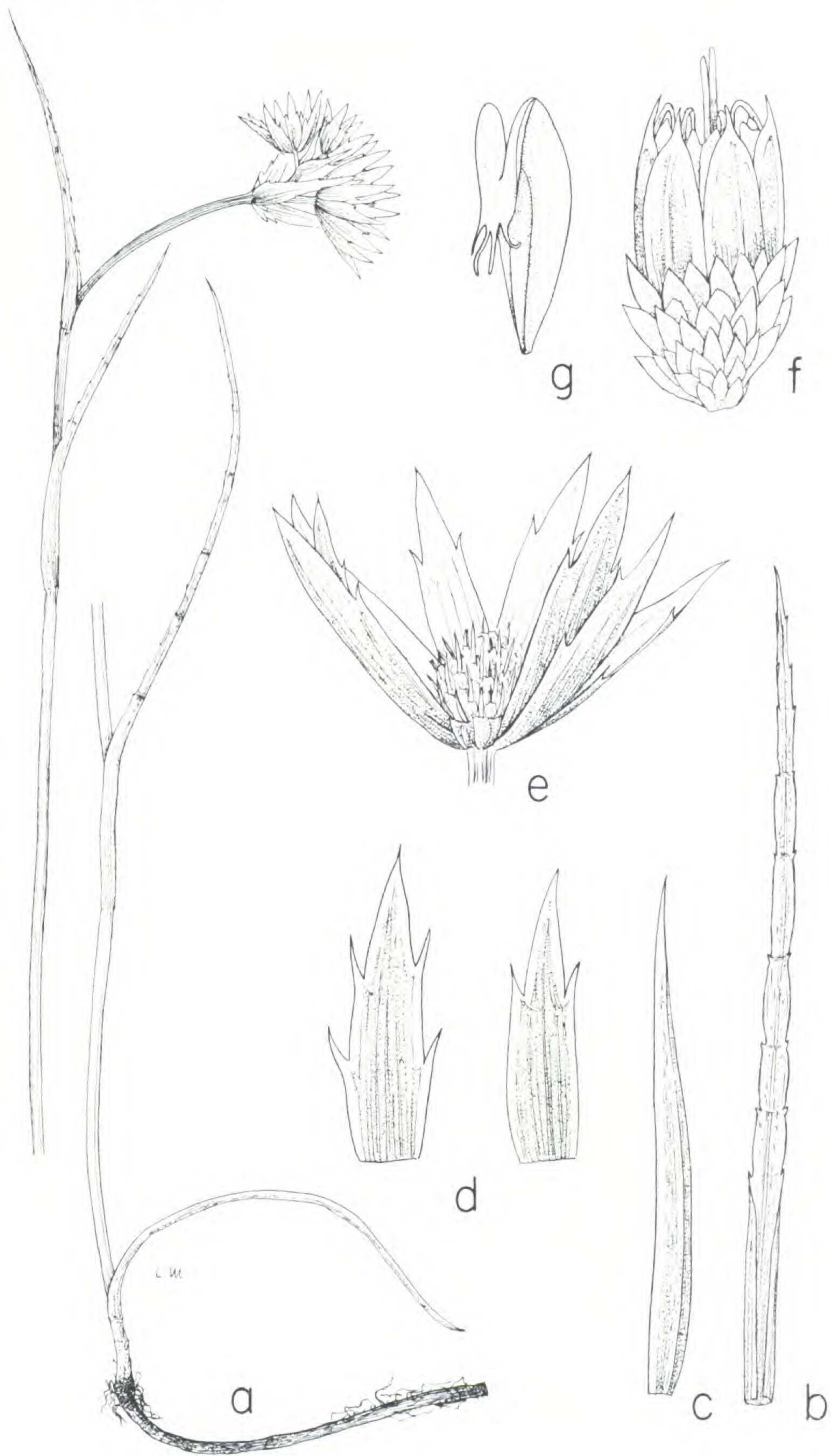
Plantae perennes graciles caulescentes haud ramosi 1.8-5 dm. altae ex caudice horizontali gracili; folia pauca alternata disticha lineari-lanceolata 3-20 cm. longa, 2-5 mm. lata, transverse septata, margine serrulato integrove, venis parallelis, vaginis amplexicaulibus latitudi-

nem laminae aequantibus vel longioribus; folia caulina summa opposita lanceolati-acuminata; inflorescentia cymosa reducta; capitula 1–3 globosa pedunculata sub-caerulea diametro 5–10 mm.; bracteae involucales 8–12 lanceolatae acutae integrae vel pauci-dentatae, inferne virides, superne argenteae, quam capitulum duplo longiores; bracteae florales lineari-acuminatae integrae fructum multo excedentes; sepala ovata ca. 2 mm. longa; petala lineari-oblonga 1–1.25 mm. longa apice fimbriata; styli graciles 2.5–3 mm. longi quam calyces longiores; fructus (immaturus) ovoideus diametro ca. 2 mm., superficiebus mericarpiorum dense squamatis, squamis ovatis subaequalibus complanatis; chromosomatum numerus $n = 7$.

Plants slender caulescent perennials 1.8–5 dm. high from a slender rootstock, the stems solitary to several, weakly erect, unbranched below inflorescence; lower leaves few, alternate, distichous, linear-lanceolate, 3–20 cm. long, 2–5 mm. broad, remotely serrulate or entire, the venation parallel, transversely septate, amplexicaul-sheathing, the sheath as broad or broader than the blade; uppermost cauline leaves opposite, lanceolate-acuminate; inflorescence a reduced cyme of 1–3 pedunculate heads; heads globose, bluish, 5–10 mm. in diameter; involucre bracts 8–12, spreading-ascending, lanceolate, 8–25 mm. long, 2–5 mm. broad, acute, entire or with one or two pairs of short teeth, green beneath, silvery-white above, about twice as long as the head; bractlets linear-acuminate, entire, much longer than fruit; sepals ovate, about 2 mm. long, mucronate; petals linear-oblong, 1–1.25 mm. long, with a narrower fimbriate tip; styles slender,

PLATE LXIV. *Eryngium Gentryi* Const. & Bye. a, Habit, $\times \frac{1}{2}$; b, cauline leaf, $\times 1$; c, floral bractlet, $\times 10$; d, involucre bracts, $\times 2$; e, immature head (two bracts removed), $\times 2$; f, flower, $\times 10$; g, petal, $\times 20$. All from Bye 4766.

PLATE LXIV



2.5–3 mm. long, longer than sepals; fruit (immature) ovoid, about 2 mm. long and broad, the squamae ovate, subequal, flattened, the dorsal faces densely squamose; chromosome number $n=7$.

TYPE: Chihuahua: Municipio de Ocampo, transition zone, pines, meadow, infrequent, marginal to streams, elevation 7500 feet, Memelichi, Rio Mayo, 16 September 1936, *H.S. Gentry 2770* (UC: holotype; K).

OTHER COLLECTIONS: Chihuahua: Municipio de Madera, lake near Chuichupa, 23 August 1936, *H. LeSueur 817* (UC); Chuichupa, 7000 feet, 21 September 1903, *I.E. Diehl s.n.* (POM); Municipio de Boconoyna, in moist meadow E of Gonogochi (on Continental Divide) E of Creel, associated with low, scrubby *Quercus*, grasses, *Ranunculus*, *Cacalia* and *Tagetes lucida*, elevation ca 7500 feet, 24 August 1973, *Robert A. Bye, Jr. 4766* (ECON, UC).

Eryngium Gentryi represents a third member of Sec. XXI. Madrensia Wolff, comprising Mexican species of wet habitats characterized by evidently transversely septate leaves, bluish or purplish ovoid-globose to ovoid-cylindrical heads, and involucre bracts conspicuously silvery above (Wolff 1913). The other two species, *E. madrense* S. Wats. and *E. fluitans* M.E. Jones (*E. mexicanum* sensu Wolff, *E. Wolffii* Mathias), are very similar in habit. There is a resemblance also to *E. phyteumae* Delar.f. (Sect. XXIV. Stellata Wolff), but this possesses well developed oblong to lanceolate, reticulately veined leaf lamina. In Sect. Madrensia, the leaves are usually bladeless or with a rudimentary lamina and not only the petiole but the entire leaf tends to be septate. The silvery upper surface of the involucre bracts suggests an affinity to both Sects. XXIV. Stellata Wolff and XXV. Carliniformia Wolff. Wolff notes that *E. phyteumae* "bildet einen deutlichen Übergang zu den Madrensia" (Wolff 1913, 61: 186). From its two allies in Sect. Madrensia, *E. Gentryi* differs in its possession of a rootstock, its fewer globose heads without a coma,

and in its broader involucre bracts that much exceed the head.

The type collection was associated by Standley with the unpublished herbarium name “*E. juncifolium* M.E. Jones”, which Jones had applied to specimens of both *E. fluitans* and *E. Gentryi*. Gentry reported the collection in his Río Mayo flora (1942) as *E. phyteumae*, as erroneously determined by Mathias and Constance. The “*E. juncifolium* Jones” listed by LeSueur in his pioneer study of Chihuahuan vegetation (1945) and attributed to the Montane Forest, is also *E. Gentryi*. The invalid name, “*E. juncifolium* M.E. Jones”, is not to be confused with the South American *E. juncifolium* (Urban) Math. & Const.

It is with great pleasure that we name this species in honor of Dr. Howard Scott Gentry, who has made such significant contributions to our knowledge of the flora of Chihuahua and other parts of Mexico.

SPECIMENS

Duplicates of the Bye collections will be deposited in the Herbario Nacional del Instituto de Biología, Universidad Nacional Autónoma de México (MEXU).

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